

Use and maintenance manual of the automatic temperature humidity  
recording system  
Compliance to normative EN-12830

## REC96-20083UC



## MADE SISTEMI

### Introduction

ATTENTION: This manual is to be considered an integral part of the temperature monitor and recorder REC96-20083UC, it must remain with the instrument and in the case of theft or loss the user must contact the producer or authorized dealer immediately to receive a substitute copy.

The absence of this manual or non observance of these regulations shall result in the invalidation of the guarantee.

The purpose of this manual is to prepare the user for correct usage of the instrument and possible devices connected to it.

It also contains the instructions for installation and regular maintenance and periodic revision as required by the norm EN 13486.

The information in this manual is clear and concise and **Made Sistemi** suggests reading the manual before use to avoid any inconvenience.

The temperature monitor and recorder REC96-20083UC meets the essential requirements of Electromagnetic Compatibility as described in the following laws (related to the temperature section) :

- EN 12830: Temperature recorders for the transport, storage and distribution of chilled, frozen, deep-frozen food and ice cream
- EN 13486: Temperature recorders for the transport, storage and distribution of chilled, frozen, deep-frozen food and ice cream. Periodic verification



## Technical characteristics

|  |                             |          |
|--|-----------------------------|----------|
| Power Supply   | 9 / 32                      | VDC      |
| Absorbed current (while not printing V=12.6)                   | 40                          | mA       |
| Absorbed current (during printing V=12.6)                      | 350                         | mA       |
| Absorbed current (during printing V=12.6 - Peak – Density 50%) | 0,8                         | A        |
| Printing speed   | 2                           | lps      |
| Back-lit LCD Screen  | 12 x 3                      | char.    |
| Measurement cycles interval                                    | 1, 2, 5, 10, 15, 20, 30, 60 | min      |
| Memory   | 32000                       | x 2 byte |
| Alarm activation delay thermostats                             | 0/600                       | sec      |
| Clock precision  | < 0.004                     | %        |
| Field of use   | - 40 / + 80                 | °C       |
| Protection rating enclosure                                    | 65                          | IP       |
| Physical dimensions  | 230 x 200 x 117             | mm       |

|                                 | Temperature     | Humidity       |
|---------------------------------|-----------------|----------------|
| Associable sensors              | 2 (PT100)       | 1 (capacitive) |
| Resolution                      | 0.1 °C          | 0.1 U%         |
| Division displayed and recorded | 0.5 °C          | 0.5 U%         |
| Thermostat alarm threshold      | -59/+59 °C      | 0/99 U%        |
| Response time                   | 120             | Sec            |
| Field of recording              | 59.5 / +59.5 °C | 0 / 99.5 U%    |
| Precision                       | ± 0.5 °C        | ± 5 %          |
|                                 | (-30 to +30 °C) | (10 to 90 U%)  |
| Protection rating sensor        | IP68            | IP30           |
| Accuracy class                  | 1               |                |

## Instructions necessary for use

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## Connected or compatible equipment and devices

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## Instructions necessary for use

### Introduction

This chapter provides general information on the type of equipment its intended use, the technologies used and an external general view.

## **1.1- Foreword**

We are very grateful that you have chosen our digital temperature monitor and recorder. Your appliance incorporates state-of-the-art technology and is produced according to the strictest quality criteria.

REC96-20083UC is designed as an automatic digital temperature and humidity reading and recording system in the range of from -59.5 to +59.5 °C and from 0% to 99 %

REC96-20083UC is equipped with a back-lit 12 x 3 LCD screen displaying the temperatures read with a division of 0.5 °C in addition to the current date and time.

It can be equipped with a tiny remote alarm repeater or a GSM device for data transmission and/or alarm message transmission through the net. The connection to GPRS, GPS and satellite module is independent from the local data download allowing a complete autonomy or customization of the service.

Identification of the REC96-20083UC is tied to a unique and not modifiable 8 characters internal code. Another 12 characters personal code is programmable from user.

By means of the configuration software (available on dealer) is possible to insert a heading of 12-16 characters show on each printout ticket, to modify the recording interval from 1 to 60 min. and others advanced regulations on thermostat and alarm.

REC96-20083UC is equipped with 2 channels of temperature and one for humidity measure for which a memory of 16.000 recordings is available everyone, exceeded such threshold the new data will be limited to cancel the first inserted ones.

Two input channel are available too and can be used to monitor the status of the doors or the ON/OFF refrigerator.

The printout functions have been particularly facilitated. By a careful analysis of the needed service, it is possible to get the printout of the desired data with the push of only a button.

The equipment have a natural installation outside of refrigerated cells, but are available ulterior accessories to fix the thermorecorder to a wall.

The system is already laboratory set, therefore no adjustment interventions are needed before use.

The recorder is equipped with a self-calibration system enabling calibration compensating work temperature variations of the equipment and variations in the length of the sensor cables. Nevertheless, calibration interventions as given in the chapter "Maintenance", are essential with a frequency recommended from the norm EN13486.

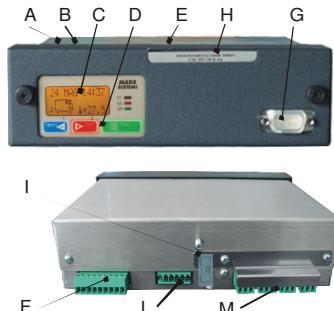
REC96-20083UC incorporates a module with dot mechanism printer that uses normal cellulose paper for a longer conservation of printer reports.

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## 1.2 - General view of appliance

REC96-20083UC (pict.1) includes :

- A** Electronic card containing the feeder part, the CPU, memories and the analogue part of the sensors
- B** The management firmware of the REC96-2008C
- C** Back-lit LCD alphanumeric display
- D** Card 3 keys + no. 2 led
- E** Container IP 40
- F** Power supply and input and output connections
- G** Connector for PC
- H** Printer report
- I** Guarantee marks
- L** remote devices
- M** Sensors connectors



pict. 1

## Installation

This chapter provides information regarding correct positioning of the equipment and its electrical connection to other connected or compatible devices.

### 2.1 - Central positioning and removing

All the following operations of installation of REC96-2008C must be done by technical assistance personnel. REC96-2008C has been developed inside a 'Standard Iso Radio' size to reduce the installation space and to facilitate the connections.

Before starting the installation check that the device is in working order by doing at least one temperature reading test and a printout of the stored data and lastly check for the warranty seal (pict.1). To install inside the control cabin, REC962008C must be positioned so as to be visible to the driver. If possible use an empty radio seat. In any case the equipment must be installed in such a way as to be protected from water or other liquids which can penetrate to the inside and cause damage.

The first operation is to fix the support to the vehicle dashboard in the proper place, bending the upper, lower and lateral internal tabs towards the outside of the support. At this point insert the device inside it until to hear a "fixing click".



To remove the thermorecorder, to take away the front panel from the device and to insert the 2 keys between the body of the instrument and the support (side pict.) After the complete insertion of the keys pull out the thermorecorder.

## 2.2 Connections

### **2.2.1 - Sensors and power supply connection**

Correct system feed will be shown by lighting up of the yellow back lighting of the LCD screen. Each time the appliance is fed, it starts a self-diagnostic sequence to check correct operation of the internal elements. In case of malfunction it blocks, signalling fault status. Once installed, the power supply must never be disconnected. As temporary power returns, the display will once again indicate the temperatures read and recording will continue in a regular manner without to loose the recorded data.

N.B: In optimal conditions, the Ram battery provides at least 2 years' holding capacity in absence of supply.

In fig. 2/B is indicated how to realize the power connection to the device. The minimum diameter of the cable to use is 0.5 mm.

CN1= Supply connector and output/input

#### CN2= GPRS-GPS module connector

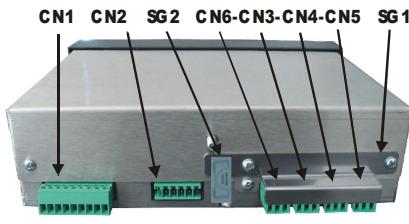
CN3= Temperature sensor 1 connector

CN3= Temperature sensor 1 connector

CN4- Temperature sensor 2 conn.

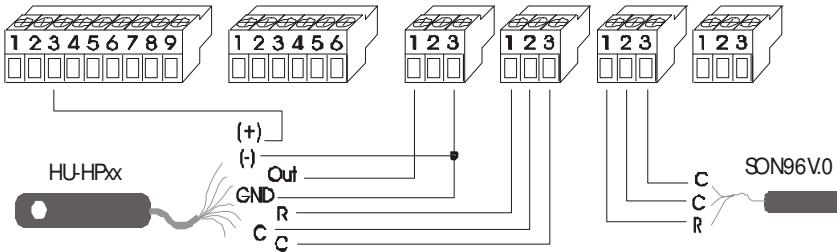
CNS= Temperature sensor

CNJ= Humidity sensor  
SG1= Antitampering sensor



(pict 2/b)

| n° | CN1         | CN2      | CN3      | CN4      | CN5      | CN6         |
|----|-------------|----------|----------|----------|----------|-------------|
| 1  | Negative    | Positive | Resistor | Resistor | Resistor | In humidity |
| 2  | Positive    | Negative | Common   | Common   | Common   | Not conn.   |
| 3  | Out (+)     | CTS      | Common   | Common   | Common   | Common      |
| 4  | Alarm 1     | RX       |          |          |          |             |
| 5  | Alarm 2     | TX       |          |          |          |             |
| 6  | Input 1 (+) | RTS      |          |          |          |             |
| 7  | Input 1 (-) |          |          |          |          |             |
| 8  | Input 2 (+) |          |          |          |          |             |
| 9  | Input 2 (-) |          |          |          |          |             |



| Descrizione | HU-HPxx                     | SON96V.0                  |
|-------------|-----------------------------|---------------------------|
| (+)         | Positive = Pink wire        |                           |
| (-)         | Negative = grey wire        |                           |
| Out         | analog output = yellow wire |                           |
| GND         | Negative = ground           |                           |
| R           | Resistor PT100 = green wire | Resistor PT100 = red wire |
| C           | Common PT100 = white wire   | Common PT100 = white wire |
| C           | Common PT100 = brown wire   | Common PT100 = white wire |

For the connection of the sensors follow the picture 6. The sensors must never be disconnected from the temperature recorder. If that happens the written SNC will be visualized. The reset procedure must be carefully followed keeping in mind the regulations for measurement equipment.

If the temperature read exceeds the measurement limits +/- OUT will be displayed. With the same text the events will be stored in memory.

Sensor technical characteristics are given in the chapter "Connected or compatible equipment and devices". It's advised to insert a fusible along the supply cable like show in picture 7.

## 2.2.2 - Repeater connection

In order to obtain connection of the LED 00/01 repeaters to the REC96-20083UC, carry out connection as show in pict. 7. The alarm 1 and 2 output are activated for thermostat and hydrostat alarm or fault in the configuration defined from the user.

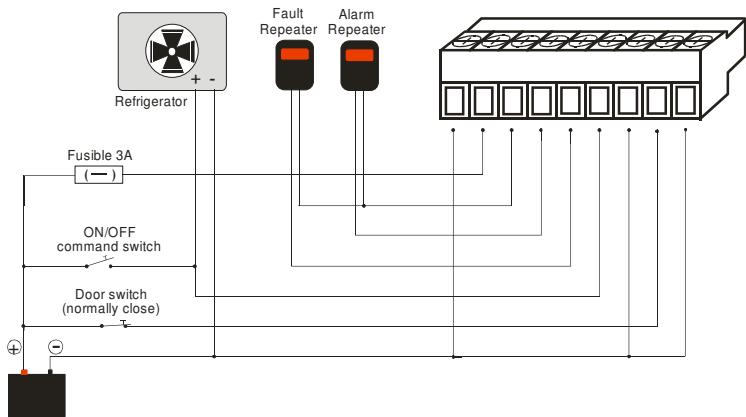
## 2.2.3 Digital input D1 “door”

The digital input D1 is dedicated to the control and record of the status of a magnetic switch on the door of the refrigerated cell. Also with short openings (>1,5 sec.) is intercepted and recorded to the end of the recording interval. The event is printed on the ticket and shown on the display. The input can activate the output alarm if programmed.

## 2.2.4 Digital input D2 “aux”

The digital input can be configured in 2 ways.

- 1) Command “On/Off refrigerator” : In this mode the recorder must be always supplied. Note: If the command is not connected it is automatically ignored. See the picture 7 for the connections. See the chapter “Autostar and Extra Time” (pag 14) for details on the service.
- 2) Command “Defroster” : If a voltage >8VDC is applied to the input it's means that it's active a defrost cycle. Also a short cycle (>1,5 sec.) is intercepted and recorded to the end of the recording interval. The event is printed on the ticket and shown on the display. See the picture 7 for the connection.
- 3) Command “Side door” : see “digital input D1”
- 4) Command “Services” : see “digital input D1” with the only difference of the text “Services”. Can be used to control whatever digital event from the truck.



pict.7

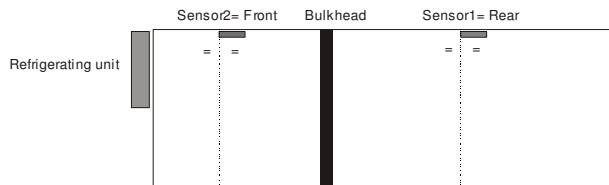
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## 2.3 – Sensor Installation

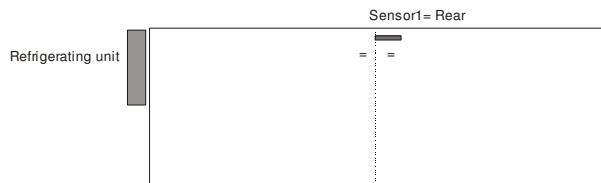
Installation method for the sensor of the temperature recorder REC96-20083UC following the regulation D.M. 493 of 25/09/95 (repealed)

In the following pictures the “Sensor 1” is the humidity sensor HU-HPxx which also incorporated the temperature sensor SON96V.0. In case of bulkhead each cells must have a number of sensors in relation to its length.

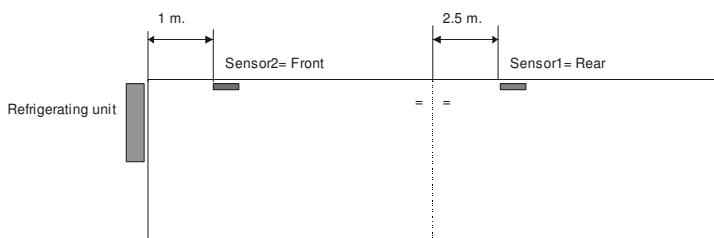
Refrigerator cell with bulkhead



Length of refrigerator cell less than 10 m.



Length of refrigerator cell more than 10 m.



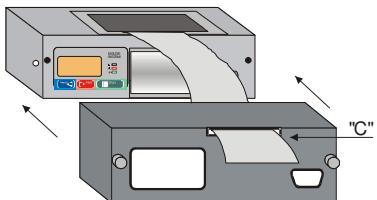
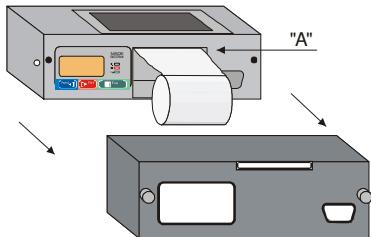
### General precautions on sensor installation:

- Do not place sensors in direct contact with walls.
- Avoid objects being placed between the air outlet of the evaporator and the sensor.
- Position the sensor's most sensitive side (metallic side) toward the refrigerating unit.

## 2.4 – Paper loading

Remove front panel and insert the paper in slot "A".

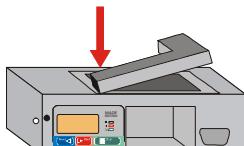
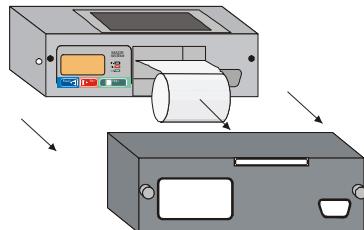
Press the **◀** button to make the paper advance until there is about 10 cm. coming out of the upper slot..



Insert paper into slot "C" and replace the panel in its original position. Cut off excess paper. (for further details on "Paper feed" see Chapter 6)

## 2.5 – Printer ribbon replacement

Remove front panel and roll of paper.



Press where shown by the arrow.

("PUSH" is written on the ribbon)

Put the new ribbon in the same position as the former.

Before replacing the roll of paper, turn on the temperature recorder and press the **◀** button for paper feed for about 10 sec. to tighten the ribbon.

After this replace the roll of paper.

## Maintenance

This chapter provides information regarding necessary maintenance on the equipment and advice on preventing inconveniences.

### 3.1 - Ordinary maintenance

Every year, starting from the date of initial installation, it is advisable to carry out a periodical check of the instrument and the sensor provided with it (EN12830).

Assessment of system conformity can be carried out by the manufacturer or by an authorised technical workshop in according with the norm EN13486. The periodical checks concern functionality tests and calibration of the measuring instrument and the relative sensors. The periodical check is certified by a sticker giving the name of the manufacturer or the workshop that carried it out.

### 3.2 - Extraordinary maintenance

The data relative to measurements carried out are stored in a lithium Ram memory battery for at least two years also in absence of external supply. The configuration data and the clock are stored in the Timekeeper memory which has its own battery with a typical life of five years.

Therefore, it is advisable to systematically replace the battery and the timekeeper after this period. The above mentioned operations for replacing parts or accessories coupled to the REC96-20083UC must be carried out by technical service personnel. Eventual faults or anomalies in the system are signalled on the display with the wordings given in the chapter "Troubleshooting".

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## FUNCTIONS

### User menu

This chapter deals with the various functions available to the user for using the REC96-20083UC. Some instrument pre-adjustment parameters can only be modified by the maker. In order to modify these parameters the container MUST be opened, removing the guarantee seals. The instrument pre-adjustment parameters which don't modify the metric part can be changed through the appropriate software.

**Customer access:** The user menu is accessed by keeping the key  pressed for a few seconds, after which the following wording appears "Print Data". Subsequently to push the key  or  to catch the desired menu and to push  to select it.

In the main menu, if no key is pressed, the system will be automatically restarted after 8 sec. while in the user menu the restart time is 30 sec.

In case of programming error it is not possible to restore previous parameters or maker parameters.

### 4.2 - Print stored data (PRINT DATA)

Menu to print the mission data. The printout request resolution is daily.

To enter in this section to execute the procedure "**Customer access**".

To select the start day through the keys  or  and push the key . To repeat the operation to set finish day. Subsequently the keys  or  will be used to reproduce a printout in text or graphic mode and with real or average data (moving average 3° type).

N.B.: In all the cases  it does not identify a choice, will be considered pre-adjusted mode.

N.B: In graphic mode the first day printed will be the most recent.

N.B.: Push for 2 sec. the key  to stop the printout.

### 4.2 - Alarm regulation (ALARM SET)

To enter in this section to execute the procedure "**Customer access**".

It allow to enable or disable the system's internal ringer ("Acoustic ") and to configure the delay activation alarm ("Activ.Delay") between 0 and 600sec (10min) in 60 step of 10 second. It allows the pre-adjustment (in bands) or manual regulation of the Min and Max threshold of the alarm thermostat for single channel ( "C1 (Rear) ", "C2 (Front) " ) or simultaneously (Monocompart) and association of an alarm to the "Events". For the humidistat is available only the manual setting.

The reactivating of acoustic alarm is automatic at every exit of regulation and/or thermostat enable menu.

With "Manual Reg.", the thermostats are adjustable in the interval between +59°C e -59°C or pre-adjusted in bands:

| Bands        | Temp. max | Temp. min |
|--------------|-----------|-----------|
| Frozen       | -15 °C    | -35 °C    |
| Refrigerated | -7 °C     | -10 °C    |
| Chilled      | +4 °C     | -1 °C     |
| Aired        | +35 °C    | 0 °C      |

NOTE: The thermostats and the humidistat are independently excludable using its menu or simultaneously with the function "Monocompart".

NOTE: In the case that the internal ringer is enabled it will be possible to turn it off by pressing one of the 3 keys on the front panel. This operation will not turn off the repeater remote. By using the appropriate software (available from dealers) you can not activate the alarm system failure on this alarm.

The internal and remote turned off is cancelled every time will exit from a menu or the system will be restarted. There is an automatic internal turned off alarm after a time-out of 5 minutes. The ringer is always enabled for fault alarm.

#### 4.3 - Display stored data (VIEW DATA)

This only displays the stored data and the last 8 fault events, if present, on the screen.

Search resolution is daily for the data stored in "(+)" Historic".

To enter in this section to execute the procedure "**Customer access**". With the presence of at least one anomaly it is enabled the option "(-)" Fault".

Approaching to the "Fault" archives is possible to reset the yellow led "FLT" only if the anomaly is not running. "Enn Res (+)". (Enn = alarm code, see fault table).

To select the desired day through the keys or and then push the key

To start the consultation press on the keys or . The stored data will be displayed in relation to the recording interval chosen. If the key or is held pressed for more than one second, will begin an automatic scroll of the stored data with an continuous increase advance speed.

When the display data vision is finished to press the key to exit from the menu.

Note: The fault menu is shown and enabled only if one anomaly is happened. In this case is activate the memory reset option that power off the yellow blinking led and to send the event in a circular code of max 8 faults with own hour-date, progressive number and alarm code. The fault logger can be deleted only from authorized dealer. With repeated events of different kind, all are stored but only the last is displayed to reset.

#### 4.4 - Definition of personal code (PERSONAL ID.)

When accessing this menu to enter another identification code (e.g. vehicle number plate or owner's name) with a maximum of 12 characters.

The personal code is evidenced in each printout, data download or SMS service.

To enter in this section to execute the procedure "**Customer access**".

The keys or allows to search the desired character, while the key is used to accept the made choice. After insertion of twelfth character press "(Save) (+) ( )".

#### **4.5 - Regulation LCD (LCD ADJUST.)**

To enter in this section to execute the procedure "**Customer access**".

It allows the regulation of "brightness" of the display's back-lit in 15 levels and of the "Contrast" in 15 steps between + 30° e -30° of corner viewing.

N.B: Attention! At extreme temperature can be necessary the contrast regulation for a better visibility of the display.

A third option "TimerLed" allows the exclusion of the autopower-off back-lit, timer therefore to remain always ON.

NB: If the TimerLed is enabled the back-lit is ignited by pressing whichever key and it will be turned off automatically after 30 sec. from the last key pressing.

#### **4.6 - Direct print configuration (DEF.PRINT.K)**

To enter in this section to execute the procedure "**Customer access**".

List of commands which allow to execute a printout by pressing only the key ► (Print). There are 4 different kind of direct printout.

- **Print mission:** In the "mission" mode the data stored from the marker "beginning of mission" to now are printed. This marker is set by a print operation.
- **Print last period:** In the "Last period" mode all data stored in a period from 3 hours to 21 days is printed. The value is adjustable from the keyboard.
- **Print from last ON:** In the "Last On" mode all data stored since the last time the instrument or the refrigeration unit was turned to now are printed..
- **Print Delivery ticket:** In the "Delivery" mode the temperature at the time of request is printed. Alternatively it is possible to request a "log print" in which the last 62 deliveries are indicated.

The configuration is completed with the choice of the data presentation "MODE" that can be "REAL" (shown the real measured data) or "AVERAGE" (shown the moving average 3° type data) , from the printout "STYLE" in "Text " or "Graphic" format and from the "Direction" "Forward" or "Rewind". The available choices will be in relation to the compatible menu with previous selection.

#### **4.7 - Language selection (SET LANGUAGE)**

To enter in this section to execute the procedure "**Customer access**".

The choice can be made between 5 language: "Italiano", "English", "Française", "Deutsch", "Espanol".

All the texts show on the display, printout or SMS will be translated in the language chosen with the exception of the 12 characters used as Personal Code.

#### **4.8 – SMS Service**

This menu is visible only if GSM service has been activated with the specific software. This allows SMS messages to be sent through the net (if connected to the optional GSM device). Please read the specific user manual for further details.

## GSM

Management of a GSM device to send SMS messages for alarm signals and/or data storage.

Characteristics of GSM service:

1. Outgoing telephone numbers (to send SMS): 3 (programmable from PC)
2. PIN code: programmable with a PC
3. Send SMS for thermostat alarm: to be activated with a PC
4. Send SMS for registration each scan time: to be activated with a PC
5. Send SMS for machine failure REC96-20083UC
6. Management of pending SMS (until new event) and line check for GSM presence, every 30 sec.
7. CALL CENTER service to download data and/or service configuration

## Paper feed

By pressing the ▶ (Feed) button for about 2 seconds the paper feeds for as long as the button is pressed.

## Recording frequency and memory capacity

In accordance with the norm EN12830 which imposes the data's conservation for at least one year, it is opportune to remember that the data download must be made within the number of day indicated in the table in relation to the recording interval chosen.

| Recording interval | n° days in memory |
|--------------------|-------------------|
| 1 min              | 21 days           |
| 5 min              | 111 days          |
| 10 min             | 221 days          |
| 15 min             | 329 days          |
| 20 min             | 435 days          |
| 30 min *           | 640 days          |
| 60 min *           | 1211 days         |

\* = Do not available if the thermorecorder is in 92/1/CEE configuration.

NB: The memory dimension is calculated in not following day too.

After the period indicate in the table the new acquired data will delete progressively the older ones. To note that with an interval of 20 - 30 - 60 min. the memory will contain more than one year of data.

NB: The recording interval must be chosen in relation to the travel's duration, in accordance with the table extracted from norm EN12830

| Recording interval | Travel's duration |
|--------------------|-------------------|
| 5 min              | <= 1 day          |
| 15 min             | <= 7 days         |
| 20 / 30 min        | > 7 days          |

The change of recording interval is followed to a complete cancellation of the data memory, therefore is necessary to download data memory before to change value.

## Autostart and ExtraTime

The thermorecorder is equipped of a command called "AUTOSTART" used to optimise the data memory when the device is always turned on and the alarm management during operative phases or parking.

By connecting the command to the refrigeration unit it is possible to start the thermorecorder and to enable the alarms at the same time of the unit power on.

When the refrigerator unit is 'ON' will be displayed the icon  near the vehicle icon, instantaneously recording will restart and the thermostat alarms and the SMS service will be enabled.

When the refrigerator unit is 'OFF' will be displayed the icon  near the vehicle and it starts a countdown of 240 min. When it expires, if the refrigerator unit is OFF, the recording will be stopped, the alarm thermostat and the SMS service disabled (if ACTIVE) showing the text "Stop regist" on the display. In stop condition the direct print command is disabled, while the customer menu is enabled.

To restart immediately the recording press the red key "► PRINT" for more than 2 seconds.

NB: All fault alarm are always enabled.

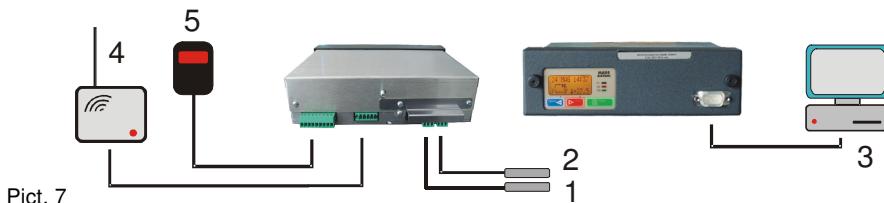
NB: AUTOSTART command is optional, and if not used will be automatically ignored at the first thermorecorder power on. The command is re-enabled if is connected to a working unit for more then one second.

## CONNECTED OR COMPATIBLE EQUIPMENT OR DEVICES

This chapter provides information regarding eventual equipment that can be connected to the REC96-20083UC.

All the following equipment must be installed by technical assistance personnel.

| Name               | Description  | N |
|--------------------|--|---|
| 9.1 SON96V.0 15mt  | 3 wire sensor PT 100 dim. 6 x 50 - Sealed – Sensor Rear  | 1 |
| 9.1 SON96V.0 11mt. | 3 wire sensor PT 100 dim. 6 x 50 - Sealed – Sensor Front | 2 |
| 9.2 RIP96V.0       | Remote repeater LCD display or PC                        | 3 |
| 9.3 SAT02V.0       | Satellite device   | 4 |
| GSM01MD            | GSM device   |   |
| 9.4 LED00/01 V.0   | Remote acoustic - optical repeaters.                     | 5 |
| POT01V.0           | Remote power repeaters.                                  |   |

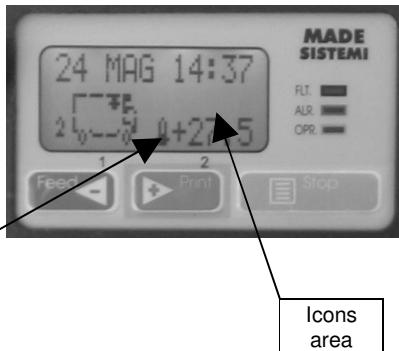


## APPENDIX

This chapter (at point 10.1) gives a list of display icons and eventual faults that can occur on the REC96-20083UC, next to possible solutions to the relative problem. It also given instructions to be followed for correct functioning and use.

## 10.1 - Display icons

In normal operation, the alphanumeric display shows running hour/date, in the top side, the shape of a motor vehicle on the left and the "state" instrument on the right side.



Decodes of the icons that can be introduced during the functioning.:

| Icons Area |                    | Thermostat Icons |                                |
|------------|--------------------|------------------|--------------------------------|
|            | SMS service ON     |                  | Battery faulty                 |
|            | GSM module ON      |                  | Recorder paused                |
|            | GSM module fault   |                  | Remote alarm                   |
|            | Bell OFF           |                  | Autostart ON (refrigerator ON) |
|            | Call Centre Active |                  | ExtraTime (refrigerator OFF)   |
|            | PC connected       |                  | Defrost                        |
|            | Side door open     |                  | Services                       |
| Truck Icon |                    |                  |                                |
|            | Front<br>Sensor 1  |                  | Rear<br>Sensor 2               |
|            | Center<br>Sensor 3 |                  | Rear door<br>open              |

## 10.2 – Advanced configurations through the PC

List of regulations available only through the configuration software (ask to the dealer for more details)

- **Heading:** It's possible to heading each printout ticket. It allows the insertion of 12-16 characters in the head of the printout ticket.
- **Thermostat:** It's possible to select which type of alarm must be sent to the remote repeater and if the its alarm output must be blinking or not.
- **Resolution:** To increase the resolution of the LCD display, it's possible to set the resolution to 0.1 °C. This setting regards only the value visualized, while the data memory will continue to be stored with the standard resolution.
- **Recording interval:** Usually regulated to 15 min. can be modified from 1 to 60 min.
- **Sensor name:** It's possible to assign a "name" to each sensor by choosing between a list of pre-assigned label: "Front", "Rear", "Product", "Rt.Air", "Near Dr", "Rt.AirR", "Top", "Bottom" and "Outside".

## 10.3 - Decodes of the alarms

| LED OPR<br>(green) | LED FLT<br>(yellow)                  | LED ALR<br>(red) | EVENTO   |
|--------------------|--------------------------------------|------------------|--|
| off                | off                                  | =                | RECORDER BLOCKED OR NOT FED  |
| off                | on                                   | =                | RECORDER BLOCKED FAULT   |
| blinking           | fast blinking                        | =                | Memory battery flat or faulty or fault on one or both sensors.         |
| blinking           | on                                   | =                | OUT OF ORDER   |
| blinking           | slow blinking                        | =                | Power supply voltage insufficient FAULT MEMORY happened anomaly memory |
| blinking           | on 2 Sec.<br>followed<br>with 3 beep | =                | Communication error with PC or printer                                 |
| =                  | =                                    | on               | Thermostat alarm   |

## 10.4 - Troubleshooting

| Fault                    | Cause                       | Cure                                |
|--------------------------|-----------------------------|-------------------------------------|
| Display does not come on | Recorder blocked or not fed | Check power supply and connections  |
| Printer does not print   |                             | Check printer cable and connections |

## 10.5 - Display texts

| Fault                     | Code | Cause   | Cure                                       |
|---------------------------|------|---|--|
| Err. GSM net<br>232 ERROR |      | Communication error with GSM net<br>Communication error with PC | Check PC connections<br>Contact the dealer |
| Data error                |      | Data memory corrupted   | Check GSM coperture                        |
| Err. rete GSM             |      | Communication error with GSM                                    | Check GSM                                  |
| Error GSM.nn              |      | Communication error with GSM                                    | connections                                |
| Fault BAT FL              | E096 | Memory battery flat or faulty                                   | Do not disconnect feed!                    |
| Fault BAT. FA             | E097 |   | Download the data and contact the dealer   |
| Fault Tec.01              | E001 | Clock to be updated or blocked!                                 | Reset recorder or contact the dealer       |
| Fault Tec.02              | E002 | Software fault  | Reset recorder                             |
| Fault Tec.04              | E004 | Input-output line fault   | Reset recorder                             |
| Fault Tec.05              | E005 | A/D converter fault   | Reset recorder                             |
| Fault Tec.06              | E006 | Communication with LCD fault                                    | Reset recorder                             |
| Fault Tec.07              | E007 | Configuration data error  | Contact the dealer                         |
| Fault Tec.08              | E008 | Ram Data fault. Recorder blocked                                | Contact the dealer                         |
| Fault Tec.99              | E099 | Clock battery flat or faulty                                    | Contact the dealer                         |
| Fault VCC.LL              | E098 | Power supply voltage insufficient                               | Check power supply voltage                 |
| OUT                       |      | Corresponding sensor out of range                               |  |
| Print Error               |      | Printer Fault   | Contact the dealer                         |
| SNC (can 1)               | E015 | Corresponding sensor not connected                              | Check sensor cable integrity               |
| SNC (can 2)               | E012 | Corresponding sensor not connected                              | Check sensor cable integrity               |
| Stop Record               |      | Recorder blocked  | Contact the dealer                         |

## 10.6 – Useful information

**IMPORTANT !** In the event the LCD breaks a slightly corrosive substance can come out.  
Avoid contact with skin and eyes

**IMPORTANT !** Improper use of the system brings about complete cancellation of the warranty and unreliable data acquisition.

**General warranty conditions** For 18 months. Products found to be faulty within this period will be promptly replaced or repaired. The warranty does not cover damage caused by improper use, but covers early ageing or breakdowns and manufacturing faults in mechanical or electrical parts. The sensors are guaranteed for 6 months, whereas the incorporated printer, 12 months. REC96-20083UC without guaranteed seals are not covered by warranty.

**NOTE** No responsibility can be accepted for the loss of stored data.

**NOTE** Resetting the recorder means turning off the power supply for approx. 10 seconds and subsequently turning it on.

**NOTE** Normally the "OPR" LED flashes with a frequency of 1 sec. When a recording is in progress the LED flashes at a faster rate. During this operation all the keyboard and print functions are disabled.

**IMPORTANT !** Do not dispose of this equipment as miscellaneous solid municipal waste, but arrange to have it collected separately. The re-use or correct recycling of the electronic and electrical equipment (EEE) is important in order to protect the environment and the well-being of humans. In accordance with European Directive WEEE 2002/96/EC, special collection points are available to which to deliver waste electrical and electronic equipment and the equipment can also be handed over to a distributor at the moment of purchasing a new equivalent type. The public administration and producers of electrical and electronic equipment are involved in facilitating the processes of the re-use and recovery of waste electrical and electronic equipment through the organisation of collection activities and the use of appropriate planning arrangements. Unauthorised disposal of waste electrical and electronic equipment is punishable by law with the appropriate penalties.

**NOTE** Manual being revised: updated to 01/01/2010



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